# SEQUENCE LISTING

<110> Kazuhiro MACHIDA et al.

<120> DNA PARTICIPATING IN HYDROXYLATION OF MACROLIDE COMPOUND

<130> 0425-1257PUS1

<140> US 10/577,655
<141> 2006-05-01

<150> JP 2003-396828
<151> 2003-11-27

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gtcccgcagc gtggtgccct tggtgccccc ggaactctcg tacagctcga cctgctcgcg     240
cacccactgc gtcgggctgg gctcgtactc gccctcaagt ggcaagggat ccgtctcctt     300
cgtcggtccg gcggatggtg ctccggacgg tcccaactcc cgcggccgcc cggatcatcc     360
gtaccgcatg ccccttcgcc cgagcgggtg atcaccgttc cggccatccg gtcgtccgca     420
ccgcgagcac caggatcacg gcgctggaga gcagggccgt gaccagccgc ccccggtggc     480
ccgtcagggc gcgacccagc agcgcgcccc cgcccgccag cagtagctgc cagctcgcgg     540
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cgccgctgcc gagcaccagc gccacgaagt agaccaccgt catgggattg agcagggtga     660
tcccgagaag gccgagataa gcccctgccg cgcctggaac cggccgttcc gggcgggtgg     720
tgagccgatg ggcgcggtac tgccgcaggg cgagcagcgc cgcccgcagc gcgagcaccg     780
cgaggaccag cgccgaggcc cagcgcagcg ggtccagcac cggccgcagc tgtgccgcga     840
gggcggcgcc gcccacggtc gcgagcagcg cgtacagccc gtcggccgtg gcgacgccga     900
gcgccgccga ggcgccggtg cgcagcgagg tgcgggcggt gagggagacc agataggtcc     960
cgaccgcgcc gacgggcacc gcgatgccgt acccggcgag caggcccgcg agcagcgcgc    1020
ccgtcacggg cgtgcgggac tggttcctcc ggggacggcg gggctgctgt cggcccggca    1080
ccgcgggggc ggtggcagcg ggcgtcggca ggagggaggc tgtaggaggc atgggccgat    1140
cctggggccg ccgcgcccgc accggcaaat gaattacggc gcgttccagc ccccggccgg    1200
ctcgctcttc ggccacttca ccgcgtacgg cgatctggcc gaacttgctg tcgccccata    1260
ggtgcctcgg gcatctaatg aagatcggca cgacgcacct cttcgtctgc gaggtctttc    1320
c atg acg gaa ctg acg gac atc acc ggc ccg ggg acc ccg gcc gaa         1366
  Met Thr Glu Leu Thr Asp Ile Thr Gly Pro Gly Thr Pro Ala Glu
    1               5                  10                  15
ccc gtc gca ttc ccc cag gac cgc acc tgc ccc tac cac ccc ccc acc      1414
Pro Val Ala Phe Pro Gln Asp Arg Thr Cys Pro Tyr His Pro Pro Thr
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                  20                  25                  30
gga tac ggc ccg ctg cgc gac ggg cgc agc ctg tcc cgc gtc acc ctc        1462
Gly Tyr Gly Pro Leu Arg Asp Gly Arg Ser Leu Ser Arg Val Thr Leu
              35                  40                  45
ttc gac ggc cgc gag gtc tgg atg gtc acg ggc cac gcc acc gcc cgc        1510
Phe Asp Gly Arg Glu Val Trp Met Val Thr Gly His Ala Thr Ala Arg
          50                  55                  60
gcg ctg ctc gcg gac ccc cgg ctg tcc acc gac cgc acc ctc ccg ggc        1558
Ala Leu Leu Ala Asp Pro Arg Leu Ser Thr Asp Arg Thr Leu Pro Gly
      65                  70                  75
ttc ccc gtg ccc acg gcc cgc ttc gcg gcc gtc cgc gac cgg cgg gtg        1606
Phe Pro Val Pro Thr Ala Arg Phe Ala Ala Val Arg Asp Arg Arg Val
  80                  85                  90                  95
gcg ctg ctc ggc gtg gac gac ccg gtc cac cag acc cag cgg cgg atg        1654
Ala Leu Leu Gly Val Asp Asp Pro Val His Gln Thr Gln Arg Arg Met
                 100                 105                 110
atg atc ccg tcg ttc acc ctc aag cgc gcg gcc ggg ctg cgg ccc acc        1702
Met Ile Pro Ser Phe Thr Leu Lys Arg Ala Ala Gly Leu Arg Pro Thr
             115                 120                 125
atc cag cgg acc gtc gac ggg ctg ctg gac gcg atg atc gag aag ggg        1750
Ile Gln Arg Thr Val Asp Gly Leu Leu Asp Ala Met Ile Glu Lys Gly
         130                 135                 140
ccg ccg gcc gag ctg gtc tcc gcc ttc gcc ctg ccc gtg ccc tcg gtg        1798
Pro Pro Ala Glu Leu Val Ser Ala Phe Ala Leu Pro Val Pro Ser Val
     145                 150                 155
gtc atc tgc ggc ctg ctc ggc gtg ccg tac gcc gac cac gag ttc ttc        1846
Val Ile Cys Gly Leu Leu Gly Val Pro Tyr Ala Asp His Glu Phe Phe
160                 165                 170                 175
gag gaa cag tcc cgc acg ctg ctg cgc ggt ccc acg gcc gcc gac tcg        1894
Glu Glu Gln Ser Arg Thr Leu Leu Arg Gly Pro Thr Ala Ala Asp Ser
                 180                 185                 190
caa ggg gcg cgc gag cgg ctc gag gag tac ctc ggc ggg ctg atc gac        1942
Gln Gly Ala Arg Glu Arg Leu Glu Glu Tyr Leu Gly Gly Leu Ile Asp
             195                 200                 205
gac aag gag cgg cag gcc gaa ccc ggc gac ggc gtc ctg gac gac ctc        1990
Asp Lys Glu Arg Gln Ala Glu Pro Gly Asp Gly Val Leu Asp Asp Leu
         210                 215                 220
gtc cac cag cgg ctg cgc acc ggc gag ctg gac cgg cgc gac gtg gtg        2038
Val His Gln Arg Leu Arg Thr Gly Glu Leu Asp Arg Arg Asp Val Val
     225                 230                 235
gcg ctg gcc gtc atc ctg ctc gtg gcc ggg cac gag acg acc gcc aac        2086
Ala Leu Ala Val Ile Leu Leu Val Ala Gly His Glu Thr Thr Ala Asn
240                 245                 250                 255
atg atc tcc ctc ggc acc tac acg ctg ctg cgg cac ccc ggc cgg ctg        2134
Met Ile Ser Leu Gly Thr Tyr Thr Leu Leu Arg His Pro Gly Arg Leu
                 260                 265                 270
gcc gag ctg cgc gcc gac ccg gcg ctg ctg ccc gcc gcc gtg gag gag        2182
Ala Glu Leu Arg Ala Asp Pro Ala Leu Leu Pro Ala Ala Val Glu Glu
             275                 280                 285
ctg atg cgg atg ctc tcg atc gcg gac ggg ctg ctg cgc ctg gcc ctg        2230
Leu Met Arg Met Leu Ser Ile Ala Asp Gly Leu Leu Arg Leu Ala Leu
         290                 295                 300
gag gac atc gag atc gcc ggc gcc acg atc cgg gcc ggc gag ggc gtc        2278
Glu Asp Ile Glu Ile Ala Gly Ala Thr Ile Arg Ala Gly Glu Gly Val
     305                 310                 315
ctg ttc tcc acc tcg ctg atc aac cgc gac gag tcc gtg ttc gac gac        2326
Leu Phe Ser Thr Ser Leu Ile Asn Arg Asp Glu Ser Val Phe Asp Asp
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320                 325                 330                 335
ccc gac acc ctg gac ttc cac cgc tcc acc cgc cac cac gtg gcc ttc        2374
Pro Asp Thr Leu Asp Phe His Arg Ser Thr Arg His His Val Ala Phe
                340                 345                 350
ggt ttc ggc atc cac cag tgc ctg ggc cag aac ctg gcc cgc gcc gag        2422
Gly Phe Gly Ile His Gln Cys Leu Gly Gln Asn Leu Ala Arg Ala Glu
            355                 360                 365
ctg gag atc gcc ctg ggc acg ctc ctg gag cgg ctc ccc ggc ctc cgg        2470
Leu Glu Ile Ala Leu Gly Thr Leu Leu Glu Arg Leu Pro Gly Leu Arg
        370                 375                 380
ctg gcc gcg ccc gcc gag gag atc ccg ttc aaa ccc ggc gac acg atc        2518
Leu Ala Ala Pro Ala Glu Glu Ile Pro Phe Lys Pro Gly Asp Thr Ile
    385                 390                 395
cag ggg atg ctg gaa ctc ccc gtg acc tgg taa gaggctctgg tc atg cac      2569
Gln Gly Met Leu Glu Leu Pro Val Thr Trp                  Met His
400                 405                                 410
atc gac atc gac aag gac cgc tgc atc ggc gcc ggc cag tgc gcg ctg        2617
Ile Asp Ile Asp Lys Asp Arg Cys Ile Gly Ala Gly Gln Cys Ala Leu
            415                 420                 425
gcc gcc ccg ggc gtg ttc acc cag gac gac gac ggc tac agc acc ctg        2665
Ala Ala Pro Gly Val Phe Thr Gln Asp Asp Asp Gly Tyr Ser Thr Leu
        430                 435                 440
ctc ccc ggc cgc gag gac ggc ggg ggc gac ccg atg gtc cgg gag gcg        2713
Leu Pro Gly Arg Glu Asp Gly Gly Gly Asp Pro Met Val Arg Glu Ala
    445                 450                 455
gcc cgc gcc tgc ccg gtg agc gcc atc cgg gtg acc gaa ccg gcc ggc        2761
Ala Arg Ala Cys Pro Val Ser Ala Ile Arg Val Thr Glu Pro Ala Gly
460                 465                 470                 475
tga ggcggggccc ggcggccgcg gcccgctgcc gggaccgccg ttcccagttc agtagg      2820


gtcgtgcgat gacctcacag gccgggaagc ccttcctcta cgtcgtcgtc tgcgcggccg      2880
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gtctcgccga cacgctcgcc gtcggcacgc tctgcgaggc ggcgggcctc ggcgtgccga      3180
tcgccgtcct gccctgcgtg gcggacgcgc tggccgccca ccccgcgtac cgggagggcc      3240
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tggagcgggc ctgaacccgc tccccgaccc gtagggcctg tctgacactg tcagacaggc      3420
cctaacggca ggtcagcgcc ggcccggcca gcatgccgcc ggtgtagagg tcctggcccc      3480
gcggcagcca gtagcccagc ctggagacca ccgtggagca gtcaggcccg acggtgacgc      3540
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acgcgagccg ggtcttcgag gtaccggccg accagcgggt tgacgcagcg ggcgtcgtcc      3660
gtggcgatcc gcaccccggt gcccgccccg ccgatgagtc cgagccgggc gctgccgtcg      3720
ccctcgtcgc tgtcccggcg gaccgtgtag gtcagcgtgg tggtggcgtc gcgccgcagg      3780
gtgtccggtc gac                                                        3793
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<211> 2329
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<213> Streptomyces sp.

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<222> (420)..(1604)

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<222> (1643)..(1834)

<400> 2

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gtacaccgcc tacctcggcc acacccagct cggacatgcc gtccgacaga gcctgccggc       180
cgaggcggca cacgaccgct atctggatgg cgtgatcgac accctcgtac ggccgcggga       240
cggaggcgat gaagccgaac atgtcacaat ctgaacgagg ttggcggaac tgcgcgcaga       300
acatgcccgg tatccgcggc atgaggtgag atcggcgcgg cgaaacacgg tgcgccacag       360
cgttgccatc tcacacacga gcaactcgag ccacttgaga ctcgtacggg aggaaattc        419

gtg acc gaa gcc atc ccc tac ttt cag aac cgc acc tgt ccc tac cac          467
Val Thr Glu Ala Ile Pro Tyr Phe Gln Asn Arg Thr Cys Pro Tyr His
  1               5                  10                  15
ccg ccc gcc gcc tat cag cca ctg cgc ggg gcc ggc ccg ctg agc cat          515
Pro Pro Ala Ala Tyr Gln Pro Leu Arg Gly Ala Gly Pro Leu Ser His
             20                  25                  30
gtc acg ttc tac gac ggc cgg aag gtg tgg gcg gtc acc ggc cac ccc          563
Val Thr Phe Tyr Asp Gly Arg Lys Val Trp Ala Val Thr Gly His Pro
         35                  40                  45
gag gca cgg gcg ctg ctg acc gac cag cga ctc tcc gcc gac cgg cag          611
Glu Ala Arg Ala Leu Leu Thr Asp Gln Arg Leu Ser Ala Asp Arg Gln
     50                  55                  60
aac ccg gcc ttc ccg gtc ccc ttc gaa cgc ttc gcg gcc atc cgc cgg          659
Asn Pro Ala Phe Pro Val Pro Phe Glu Arg Phe Ala Ala Ile Arg Arg
 65                  70                  75                  80
gtc cgg acg ccg ctg atc ggg gtc gac gac ccg gag cac aac acc cag          707
Val Arg Thr Pro Leu Ile Gly Val Asp Asp Pro Glu His Asn Thr Gln
                 85                  90                  95
cgc cgg atg ctg atc ccc agc ttc agc ctc aag cgg acc gcc gca ctg          755
Arg Arg Met Leu Ile Pro Ser Phe Ser Leu Lys Arg Thr Ala Ala Leu
            100                 105                 110
cgg ccg gag atc cag cgg atc gtc gac ggg ctg ctc gac cgg atg ctg          803
Arg Pro Glu Ile Gln Arg Ile Val Asp Gly Leu Leu Asp Arg Met Leu
        115                 120                 125
gat cag ggc ccg ccc acc gag ctg gtc tcc gcg ttc gcc ctg ccg gtc          851
Asp Gln Gly Pro Pro Thr Glu Leu Val Ser Ala Phe Ala Leu Pro Val
    130                 135                 140
ccg tcg atg gtg atc tgc gca ctg ctc gga gtc tca tac gcc gac cat          899
Pro Ser Met Val Ile Cys Ala Leu Leu Gly Val Ser Tyr Ala Asp His
145                 150                 155                 160
gag ttc ttc gag gag gag tcc cgc cgc atc ctg cgc ggc cgg tcg gcc          947
Glu Phe Phe Glu Glu Glu Ser Arg Arg Ile Leu Arg Gly Arg Ser Ala
                165                 170                 175
gag gag gcg gag gac gcc cgg ctg aag ctg gag gag tac ttc acc ggg          995
Glu Glu Ala Glu Asp Ala Arg Leu Lys Leu Glu Glu Tyr Phe Thr Gly
            180                 185                 190
ctg atc gcc gcc aag gag aag aac ccg ggc gac ggg ctg ctg gac gag         1043
Leu Ile Ala Ala Lys Glu Lys Asn Pro Gly Asp Gly Leu Leu Asp Glu
        195                 200                 205
ctg atc gag gac cgg ctg cgg acc ggc gcg ctc acc cgc gac gag ctg         1091
Leu Ile Glu Asp Arg Leu Arg Thr Gly Ala Leu Thr Arg Asp Glu Leu
    210                 215                 220
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gtc cgg ctc gcc atg atc ctg ctg gtg gcc ggc cat gag acc acc gcc        1139
Val Arg Leu Ala Met Ile Leu Leu Val Ala Gly His Glu Thr Thr Ala
225                 230                 235                 240
aac atg atc tcg ctc ggc acc ttc acc ctg ctg gac cac ccc gag cag        1187
Asn Met Ile Ser Leu Gly Thr Phe Thr Leu Leu Asp His Pro Glu Gln
                245                 250                 255
ctg gcg cag ctc aag gcc gac gag ggc ctg atg ccg gcc gcc atc gag        1235
Leu Ala Gln Leu Lys Ala Asp Glu Gly Leu Met Pro Ala Ala Ile Glu
            260                 265                 270
gag ctg ctg cga ttc ctg tcc atc gcg gac ggc ctg ctg cgg gtg gcg        1283
Glu Leu Leu Arg Phe Leu Ser Ile Ala Asp Gly Leu Leu Arg Val Ala
        275                 280                 285
acg gag gac atc gag atc ggc ggt cag gtg atc cgg gcc gac gac gcg        1331
Thr Glu Asp Ile Glu Ile Gly Gly Gln Val Ile Arg Ala Asp Asp Ala
    290                 295                 300
gtc ctg ttc ccc gcc tca ctg atc aac cgg gac gag gcc gcc tat ccg        1379
Val Leu Phe Pro Ala Ser Leu Ile Asn Arg Asp Glu Ala Ala Tyr Pro
305                 310                 315                 320
gca ccc gac gag ctg gac ctc ggc cgt tcg gcc cgc cat cac gtg gcg        1427
Ala Pro Asp Glu Leu Asp Leu Gly Arg Ser Ala Arg His His Val Ala
                325                 330                 335
tcc ggc ttc ggg atc cac cag tgc ctg ggg cag aac ctc gcc cgc gcg        1475
Ser Gly Phe Gly Ile His Gln Cys Leu Gly Gln Asn Leu Ala Arg Ala
            340                 345                 350
gag atg gag atc gcg ctg cgc tca ctg ttc acc agg atc ccg cag ctg        1523
Glu Met Glu Ile Ala Leu Arg Ser Leu Phe Thr Arg Ile Pro Gln Leu
        355                 360                 365
cgg ctc gcc gtg ccg gcc gcc gag att ccg ttc aag gac gga gac acc        1571
Arg Leu Ala Val Pro Ala Ala Glu Ile Pro Phe Lys Asp Gly Asp Thr
    370                 375                 380
ctg caa ggc atg atc gaa ctg ccg ctg gcc tgg tag cagccaggac ggcaga      1623
Leu Gln Gly Met Ile Glu Leu Pro Leu Ala Trp
385                 390                 395
ccaaagaaag gggtccgga atg cgg atc gcg atc gac acc gac cgc tgt atc        1675
                    Met Arg Ile Ala Ile Asp Thr Asp Arg Cys Ile
                                    400                 405
ggc gcc ggc cag tgt gcc ctg acc gcg ccc ggg ggt ttc acc cag gat        1723
Gly Ala Gly Gln Cys Ala Leu Thr Ala Pro Gly Gly Phe Thr Gln Asp
            410                 415                 420
gac gac ggt ttc agt gca ctg ctg ccc ggc cgg gag gac ggc gcc ggc        1771
Asp Asp Gly Phe Ser Ala Leu Leu Pro Gly Arg Glu Asp Gly Ala Gly
        425                 430                 435
gac ccg ctg gtg cgg gaa gcc gcc cgc gcc tgc ccc gtg cag gcc att        1819
Asp Pro Leu Val Arg Glu Ala Ala Arg Ala Cys Pro Val Gln Ala Ile
    440                 445                 450
gcg gtc acc gac gat tag cagcaccccc gcggacgacc cggcagacgc gcgcggcc      1875
Ala Val Thr Asp Asp
455
ccggctgaca cccggcgccc gaggcgcgcc cgagccgtcc gcccctccac ttgtccctac      1935
ggcatccacc ccatccgcta ccgcaacacc ccttgggtga cgggcagttt cgaggacccc      1995
ggtgtgcccg gggcgtactg gtgaccgtca ccggcttcac gccgcgattg cccacatagg      2055
cgtcgtcgct cgcggcgatc acgaagcgcg gtcggtgccc cggctcgtaa cggtgcacga      2115
tgcccggcag ttccacggtg aaccgccggg ccacatcggg cacccgggcc ggggccacca      2175
acaggtgcac cagcgtcttc ctgccgttcg gcgcgacatc gtagagcttg gcgaacagca      2235
ccagcttgtc cgccgcatcc gcggaccgct gcgcccgccc ggcctgcggc gaggcaacct      2295
tcagcgtcac cctcggcgcg cccaccacgt cgac                                  2329
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<210> 3
<211> 1860
<212> DNA
<213> Unknown

<220>
<223> Description of Unknown Sequence: nucleotide sequence with coding region derived from an unknown source

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<222> (172)..(1383)

<220>
<221> CDS
<222> (1399)..(1593)

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gggcatctaa tgaagatcgg cacgacgcat ccttcgtctg cgaggtctcc c atg aca 177
Met Thr
1

gac acg aca gac ctg acc gag ctg tca gat ccc gtc tcc ttc ccc cag 225
Asp Thr Thr Asp Leu Thr Glu Leu Ser Asp Pro Val Ser Phe Pro Gln
5 10 15

gac cgg agc tgc ccc tac cac ccg ccc acc ggg tac gac ccg ctg cgc 273
Asp Arg Ser Cys Pro Tyr His Pro Pro Thr Gly Tyr Asp Pro Leu Arg
20 25 30

acc gaa cgg ccg ccc gcc cgc atc cgg ctc tac gac ggc cgc ccc gcc 321
Thr Glu Arg Pro Pro Ala Arg Ile Arg Leu Tyr Asp Gly Arg Pro Ala
35 40 45 50

tgg ctc gtc acc ggc cac gcc gtc gcc cgt gac ctg ctg gtc gac ccc 369
Trp Leu Val Thr Gly His Ala Val Ala Arg Asp Leu Leu Val Asp Pro
55 60 65

cgc ctg tcc acg gac cgc acc cgc tcg ggc ttc ccg gcc aca act ccc 417
Arg Leu Ser Thr Asp Arg Thr Arg Ser Gly Phe Pro Ala Thr Thr Pro
70 75 80

cgc ttc gcc gcg gtc cgc gac cgc aag ccg gcg ctc ctc ggc gtc gac 465
Arg Phe Ala Ala Val Arg Asp Arg Lys Pro Ala Leu Leu Gly Val Asp
85 90 95

gac ccc aag cac cgc acc cag cgg tgg atg atg atc ccg agc ttc acc 513
Asp Pro Lys His Arg Thr Gln Arg Trp Met Met Ile Pro Ser Phe Thr
100 105 110

ctc agg cgc gcc acc gag ctc agg ccg cgc atc cag gag atc gtc gac 561
Leu Arg Arg Ala Thr Glu Leu Arg Pro Arg Ile Gln Glu Ile Val Asp

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115                 120                 125                 130

gaa ctg ctg gac gtg atg atc gcc cag gga ccc ccg gcc gac ctg gtg      609
Glu Leu Leu Asp Val Met Ile Ala Gln Gly Pro Pro Ala Asp Leu Val
                135                 140                 145

cgt tcc ttc gcg ctg ccg gtg ccg tcc atg gtg atc tgc gcc ctg ctc      657
Arg Ser Phe Ala Leu Pro Val Pro Ser Met Val Ile Cys Ala Leu Leu
            150                 155                 160

ggc gtg ccc tac gcc gac cac gag ttc ttc gag gac cag tcc agg cgg      705
Gly Val Pro Tyr Ala Asp His Glu Phe Phe Glu Asp Gln Ser Arg Arg
        165                 170                 175

ctg ctg cgc gga ccg gcg gcc gag gac acg cag gac gcc cgg gac cgg      753
Leu Leu Arg Gly Pro Ala Ala Glu Asp Thr Gln Asp Ala Arg Asp Arg
    180                 185                 190

ctc gcc gcg tac ctg gag gac ctg atc gac gag aag cgg cgc cgg ccc      801
Leu Ala Ala Tyr Leu Glu Asp Leu Ile Asp Glu Lys Arg Arg Arg Pro
195                 200                 205                 210

ggt gac ggc ctg ctg gac gaa ctc gtc cag cag cgt ctg aac gaa ggc      849
Gly Asp Gly Leu Leu Asp Glu Leu Val Gln Gln Arg Leu Asn Glu Gly
                215                 220                 225

gag ctc gac cgg gag gaa ctg acc gcg ctg gcg atg atc ctg ctg gtc      897
Glu Leu Asp Arg Glu Glu Leu Thr Ala Leu Ala Met Ile Leu Leu Val
            230                 235                 240

gcg ggc cac gag acc acc gcc aac atg atc tcc ctg ggc acc tac acg      945
Ala Gly His Glu Thr Thr Ala Asn Met Ile Ser Leu Gly Thr Tyr Thr
        245                 250                 255

ctc ctg ctg cac ccc gaa cgg ctg acc gag ctg cgc gcc gac ccc gcg      993
Leu Leu Leu His Pro Glu Arg Leu Thr Glu Leu Arg Ala Asp Pro Ala
    260                 265                 270

ctg ctg ccg gcc gcc gtc gag gaa ctg atg cgg atg ctg tcc atc gcg     1041
Leu Leu Pro Ala Ala Val Glu Glu Leu Met Arg Met Leu Ser Ile Ala
275                 280                 285                 290

gac gga ctg ctg cgg cag gcc acc gag gac atc gag atc gcc ggg acc     1089
Asp Gly Leu Leu Arg Gln Ala Thr Glu Asp Ile Glu Ile Ala Gly Thr
                295                 300                 305

acc atc agg gcc ggg gac ggc gtg gtc ttc tcc acc tct gtc atc aac     1137
Thr Ile Arg Ala Gly Asp Gly Val Val Phe Ser Thr Ser Val Ile Asn
            310                 315                 320

cgc gac gag gac gtc tac ccg gcc ccc gac acc ctc gac ttc cac cgc     1185
Arg Asp Glu Asp Val Tyr Pro Ala Pro Asp Thr Leu Asp Phe His Arg
        325                 330                 335

tcg acc cgc cac cac gtc gcc ttc ggt ttc gga atc cac cag tgc ctc     1233
Ser Thr Arg His His Val Ala Phe Gly Phe Gly Ile His Gln Cys Leu
    340                 345                 350
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ggc cag aac ctc gcc cgc acc gaa ctg gag atc gcc ctg cgc acg ctc     1281
Gly Gln Asn Leu Ala Arg Thr Glu Leu Glu Ile Ala Leu Arg Thr Leu
355                 360                 365                 370

ctc gaa cgg ctg ccc acg ctc cgg ctc gcc gcc cca ccg gag gaa atc     1329
Leu Glu Arg Leu Pro Thr Leu Arg Leu Ala Ala Pro Pro Glu Glu Ile
                375                 380                 385

ccc ttc aaa ccc ggc gac acc atc cag ggg atg ctg gaa ctc ccc gtc     1377
Pro Phe Lys Pro Gly Asp Thr Ile Gln Gly Met Leu Glu Leu Pro Val
            390                 395                 400

agc tgg taagaggctg ccgtc atg cat atc gag atc gac aag gac cgc tgc    1428
Ser Trp                 Met His Ile Glu Ile Asp Lys Asp Arg Cys
                        405                 410

atc ggc gcc gga cag tgc gcc ctg acc gcc ccg ggt gtg ttc acc cag     1476
Ile Gly Ala Gly Gln Cys Ala Leu Thr Ala Pro Gly Val Phe Thr Gln
415                 420                 425                 430

gac gac gac ggc ttc agt gac ctg ttg ccc ggc cgg gag gac ggc gcc     1524
Asp Asp Asp Gly Phe Ser Asp Leu Leu Pro Gly Arg Glu Asp Gly Ala
                435                 440                 445

ggc gac ccg atg gtc cgg gag gcc gcc agg gcc tgc ccc gtg agt gcc     1572
Gly Asp Pro Met Val Arg Glu Ala Ala Arg Ala Cys Pro Val Ser Ala
            450                 455                 460

atc acg ctg tcc gag gac ggg taggggccg agccgcgccg cccgccggtc        1623
Ile Thr Leu Ser Glu Asp Gly
        465

cgctgccgcg gcgccgtgcc gacgcggcgg ccggccggcc cgtccggtgc ccgtcgcgtc   1683

gccccgtggc cccggcggcg gctgattgac tagggttccc gggtgagcga acaggcccag   1743

aagccctccg gggcgccgcc cgcgaaagac accgggacgg cgcccgggaa acccccttcct  1803

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